

SIEMENS

MAMMOMAT 3/C3/300/3000

SP

Service

Repair Instructions

Replacing the transistors -
"MAMMOMAT Powerstage service kit"

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Chapter	Page	Revision
all	all	04

Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

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Required tools and auxiliary devices

- Standard service kit
- Soldering iron and tin/lead solder
- Oscilloscope
- Heat conducting paste, e. g. WPS, material No. 20 48 650

Contents of the "MAMMOMAT Powerstage service kit"

- "MAMMOMAT Powerstage service kit" 57 61 122 X2051
- This Repair Instruction - English 1 pc.

NOTE

The Spare Parts Catalogue identifies as spare part only the assembly "MAMMOMAT Powerstage service kit", having the material no. 57 61 122. This kit consists of:

- the PCB D710 "Inverter" 57 61 106
- the "Modular unit" 57 61 114.

This instruction describes the installation of such kits, where:
the PCB D710 - Inverter, 5761106 has the revision level 03, and
the Modular unit, 5761114 has the revision level 01.

Safety information and protective measures

Prior to performing any work inside the unit, the system must be disconnected from the main power by switching off the main power switch. Always switch off the line voltage before removing or inserting a board. Set switch S2 (SS) on board D702 to "OFF" to prevent accidental switch on of high voltage and possible radiation release.

WARNING

When the system is switched off via the operating panel or via S2/D711 only, voltage is still present at the generator power connection, at line filters Z1, Z2, at transformer T1, at transformer T10 and at board D711 (refer to the circuit diagram).

WARNING

After switching off the system, approximately 380V DC may be present at the intermediate circuit as indicated by the V24 LED on board D710. Within 3 minutes, the voltage will drop to less than 30 V, and the LED will go out.



- **When performing repair work and tests, adhere to:**
 - the product-specific safety information in the technical documentation (system binder),
 - as well as the general safety information in the ARTD Part 2.
- **Switch the generator off before removing or inserting boards. When performing this work, adhere to ESD guidelines.**
- **Tests or adjustments that must be performed with radiation ON are identified by the radiation warning symbol . During these types of adjustments, radiation protection must be observed.**

Additional information

The "old type" transistors V1 - V4 (material No. 77 41 465 or 93 96 276) are no longer available. These transistors were attached directly to the high voltage transformer and could be individually replaced.

The "new" transistors can no longer be individually replaced and are pre-assembled on a metal plate (transistor module unit, material No. 57 61 114). As of the revision level (product status) AS 01, the transistor module unit incorporates an additional printed circuit (wiring) board D750, material No. 74 62 711, which, having been pre-assembled in production, facilitates the exact positioning of the transistor connecting leads.

Inverter board D710 must also be replaced when replacing the transistors (new: "D710 Inverter mod.", material No. 57 61 106). These two main parts shouldn't be replaced individually, but both at a time.

The new "Mammomat Powerstage Service kit" (material No. 57 61 122) is required when replacing the old type transistors or the old type D710 inverter board (material No. 86 11 154). This kit contains the new inverter board (D710 Inverter mod.), the new transistors (in a transistor module unit), and some other installation materials.

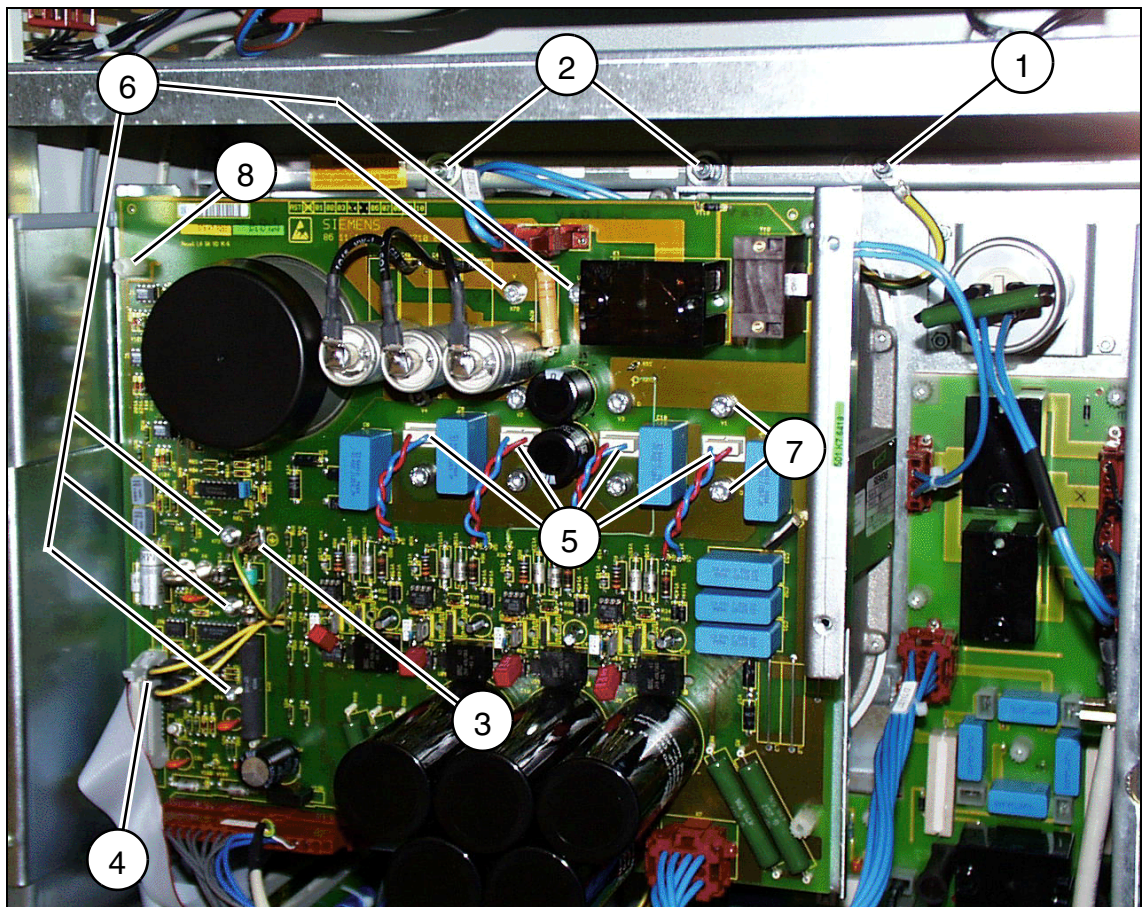


Fig. 1

NOTICE

Adhere to ESD guidelines when performing the following work.

- Switch the system OFF.
- Remove the front cover (control side) from the generator.

⚠ WARNING

After switching off the system, approximately 380V DC may be present at the intermediate circuit as indicated by the V24 LED on board D710. Within 3 minutes, the voltage will drop to less than 30 V, and the LED will go out.

- Remove the Plexiglas cover (in front of the inverter board D710).
- Remove the high voltage connector.
- Disconnect plugs X7, X6, X2 and X12 on D710.
- Cut off the cable ties attaching the cables from these plugs to the high voltage generator.
- Remove the ground cable at the back wall of the generator (1/ Fig. 1).

- Remove the 2 attachment screws (2/Fig. 1) from the high voltage generator.

**CAUTION**

When doing this, push the high voltage generator back so that it does not tip forward.

- Lift the high voltage generator, remove it and place it on a work surface.
- Remove ground cable X1 (3/Fig. 1).
- Label wires X101 and X102 and disconnect them (4/Fig. 1).
- for D710 only, material No. 86 11 154:
 - Disconnect the 4 plugs of the transistor module (V1 - V4) (5/Fig. 1).
- for D710 only, material No. 57 61 106:
 - Desolder the 8 connection wires from the transistor module (V1 - V4) on D710 (1/Fig. 2).
- Remove the 5 Allen screws X71 - X75 (6/Fig. 1).

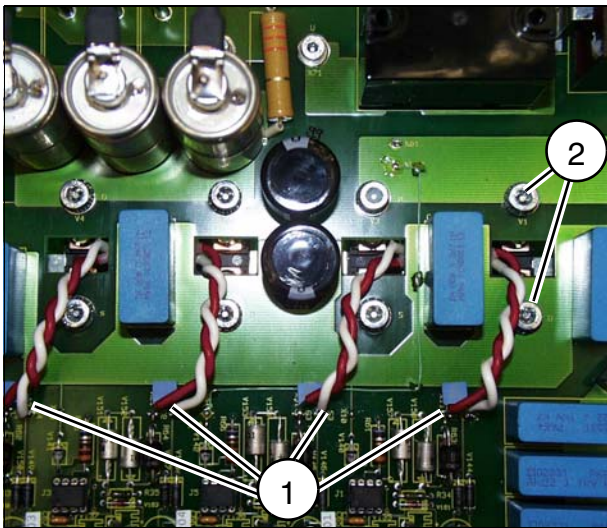


Fig. 2

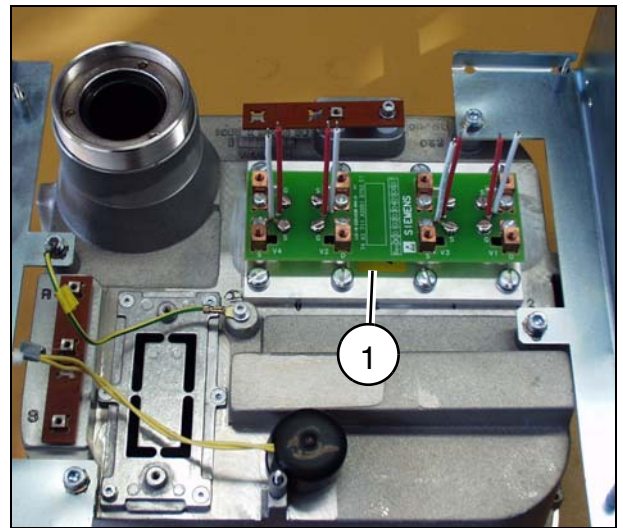


Fig. 3

- Remove the 8 Allen screws (7/Fig. 1 or 2/Fig. 2) of the transistor module.
- Remove the 5 plastic nuts (8/Fig. 1).
- Remove the D710 board from the high voltage transformer.
- Remove the 4 transistor modules (old type) or the transistor module unit (1/Fig. 3) (8 screws).
- Remove the newly delivered transistor module unit from the packaging.

CAUTION

The maximum permissible torque of
a) the device mounting screws and of
b) the electrical terminations S,S,G,D
is 1.5 Nm (13 lb-in).

The screws have been correctly tightened during the production,
the need for their re-tightening should not arise.

- Spread a thin, even layer of heat conducting paste on the underside of the aluminum plate.
- Remove the ESD foam rubber.
- Attach the transistor module unit with the 8 screws to the high voltage transformer (1/Fig. 3).

NOTICE

When installing the module for the first time, use the slotted screws (with the washers and lockwashers) from the "Mammomat Power Service kit".

- Place the D710 inverter board on the high voltage transformer. When doing this, route all the cables through the cutouts provided in the board.

NOTICE

When installing the transistor module unit for the first time, use the new D710 board from the "Mammomat Power Service kit".

- Attach D710 to the transistor module unit with the 8 Allen screws (M5 x 10) (2/Fig. 2).

NOTICE

When installing the module for the first time, use the Allen screws (with washers and lockwashers) from the "Mammomat Power Service kit".

- Tighten the 5 Allen screws X71 - X75 (6/Fig. 1).
- Tighten the 5 plastic nuts (8/Fig. 1).
- Connect wires X101 and X102 (4/Fig. 1).
- Connect the ground cable X1 (3/Fig. 1).
- Connect transistor module V1:
 - twist the 2 wires (red and white) **four times**.
 - solder the white wire to solder point X13.
 - solder the red wire to solder point X11.
- Connect transistor module V3:
 - twist the 2 wires (red and white) **five times**.
 - solder the white wire to solder point X32.
 - solder the red wire to solder point X31.
- Connect transistor module V2:
 - twist the 2 wires (red and white) **four times**.
 - solder the white wire to solder point X22.
 - solder the red wire to solder point X21.
- Connect transistor module V4:
 - twist the 2 wires (red and white) **five times**.
 - solder the white wire to solder point X42.
 - solder the red wire to solder point X41.
- Install the high voltage generator following the procedure for removal in the reverse order.

Checks and adjustments



Take test exposures with the small and large focus. Check the kV_{ist} and mA_{ist} waveforms on the oscilloscope.

Page	Chapter	Change
1-1	Contents of the "MAMMOMAT Powerstage service kit"	Contents and revision level added as NOTE.
2-5	Additional steps....	Fig. 4 and Paragraph deleted.

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